What is claimed is:

1. A method for obtaining a global optimal solution of general nonlinear programming problems, comprising the steps of:

a) in a deterministic manner, first finding all local optimal solutions; and

b) then finding from said local optimal solutions a global optimal solution.

2. A method for obtaining a global optimal solution of general nonlinear programming problems, comprising the steps of:

a) in a deterministic manner, first finding all stable equilibrium points of a nonlinear dynamical system that satisfies conditions (C1) and (C2); and

b) then finding from said points a global optimal solution.

3. A practical numerical method for reliably computing a dynamical decomposition point for large-scale systems, comprising the steps of:

a) moving along a search path $\varphi_t(x_s) \equiv \{x_s + t \times \hat{s}, \quad t \in \Re^+\}$ starting from x_s and detecting an exit point, x_{ex}, at which said search path $\varphi_t(x_s)$ exits a stability boundary of a stable equilibrium point x_s;

b) using said exit point x_{ex} as an initial condition and integrating a nonlinear system (4.2) to an equilibrium point x_d; and

c) computing said dynamical decomposition point with respect to a local optimal solution x_s wherein said search direction $\hat{s}$ is e x_d.

4. The method of claim 3, wherein a method for computing said exit point comprises the step of:

moving along said search path $\varphi_t(x_s) \equiv \{x_s + t \times \hat{s}, \quad t \in \Re^+\}$ starting from x_s and detecting said exit point x_{ex}, which is a first local maximum of an objective function $C(x)$ along said search path $\varphi_t(x_s)$.

5. The method of claim 3, wherein a method for computing a minimum distance point (MDP) comprises the steps of:

a)using said exit point x_{ex} as an initial condition and integrating a nonlinear system (4.2) to a first local minimum of a norm $\|F(x)\|$, where $F(x)$ is a vector of a vector field (4.2), and a local minimum point is x_d^0;

b) using said MDP $x_{d,j}^{i,0}$ as an initial guess and solving a set of nonlinear algebraic equations of said vector field (4.2) $F(x) = 0$, wherein a solution is x_d, and a dynamical decomposition point with respect to the local optimal solution x_s and said search path $\varphi_t(x_s)$ is x_d.

6. The method of claim 3, wherein a method for computing said exit point comprises the step of computing an inner-product of said search vector and vector field at each time step, by moving along said search path $\varphi_t(x_s) \equiv \{x_s + t \times \hat{s}, \quad t \in \Re^+\}$ starting from x_s and at each time-step, computing an inner-product of said search vector $\hat{s}$ and vector field $F(x)$, such that when a sign of said inner-product changes from positive to negative, said exit point is detected.

7. The method of claim 3, wherein a method for computing said exit point comprises the step of:

a) moving along said search vector until an inner-product changes sign between an interval $[t_1, t_2]$;

b) applying a linear interpolation to an interval $[t_1, t_2]$, which produces an intermediate time t_0 where an interpolated inner-product is expected to be zero;

c) computing an exact inner-product at t_0, such that if said value is smaller than a threshold value, said exit point is obtained; and

d) if said inner-product is positive, then replacing t_1 with t_0, and otherwise replacing t_2 with t_0 and going to step b).

8. The method of claim 3, wherein a method for computing a minimum distance point (MDP) comprises the steps of:

a) using said exit point as an initial condition and integrating a nonlinear system for a few time-steps;

b) checking convergence criterion, and, if a norm of said exit point obtained in step a) is smaller than a threshold value, then said point is declared as said MDP, and otherwise, going to step b);

c) drawing a ray connecting a current point on a trajectory and a local optimal solution, replacing said current point with a corrected exit point, which is a first local maximal point of objective function along said ray, starting from a stable equilibrium point, and assigning this point to said exit point and going to step a).

9. The method of claim 3, wherein a method for computing said dynamical decomposition point with respect to a stable equilibrium point x_s and a search vector $\hat{s}$, comprises the steps of:

a) moving along said search path $\varphi_t(x_s) \equiv \left\{x_s + t \times \hat{s}, t \in \Re^+\right\}$ starting from x_s and detecting a moment that an inner-product of said search vector $\hat{s}$ and vector field $F(x)$ changes sign, between an interval $\left[t_1, t_2\right]$, stopping this step if t_1 is greater than a threshold value and reporting that there is no adjacent local optimal solution along this search path, and otherwise, going to step b);

b) applying linear interpolation to said interval $\left[t_1, t_2\right]$, which produces an intermediate time t_0 where said interpolated inner-product is expected to be zero, computing an exact inner-product at t_0, and if said value is smaller than a threshold value, said exit point is obtained, and going to step d);

c) if said inner-product is positive, then replacing t_1 with t_0, and otherwise replacing t_2 with t_0 and going to step b);

d) using said exit point as an initial condition and integrating a nonlinear system for a few time-steps;

e) checking convergence criterion, and if a norm of said point obtained in step d) is smaller than a threshold value, then said point is declared as the MDP and going to step g), and otherwise going to step e);

f) drawing a ray connecting a current point on said trajectory and a local optimal solution, replacing said current point with a corrected exit

point which is a first local maximal point of objective function along said ray starting from a stable equilibrium point, and assigning this point to said exit point and going to Step d); and

g) using said MDP as an initial guess and solving a set of nonlinear algebraic equations of the vector field (4.2) $F(x) = 0$, wherein a solution is t_d, such that said DDP with respect to a local optimal solution x_s and vector $\hat{s}$ is x_d.

10. The method of claim 3, wherein at least one effective local search method is combined with said dynamical trajectory method of claim 3, comprising the steps of:

a) given an initial point, integrating a nonlinear dynamical system described by (4.2) that satisfies condition (C1) from an initial point for a few time-steps to get an end point and then updating said initial point using an endpoint, before going to step b);

b) applying an effective local optimizer starting from said end point in step a) to continue the search process. , and if it converges, then stopping, or otherwise, returning to step a).

11. The method of claim 3, wherein said method is used to accomplish a result selected from the group consisting of:

a) escaping from a local optimal solution;

b) guaranteeing the existence of another local optimal solution;

c) avoiding re-visit of a local optimal solution of step b);

d) assisting in searching a local optimal solution of step b); and

e) guaranteeing non-existence of another adjacent local optimal solution along a search path.

12. The method of claim 3, wherein a numerical method for performing a procedure, which searches from a local optimal solution to find another local optimal solution in a deterministic manner, comprises the steps of:

a) moving along a search path starting from x_{opt} and applying said DDP search method to compute a corresponding DDP, and going to step

b), and if a DDP can not be found, then trying another search path and repeating this step;

b) letting said DDP be denoted as x_d., and if x_d has previously been found, then going to step a), otherwise going to step c);

c) computing a DDP-based initial point $x_o = x_{opt} + (1+\varepsilon)(x_d - x_{opt})$ where ε is a small number, and applying a hybrid search method starting from x_0 to find a corresponding adjacent local optimal solution.